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The Central Hardwood Forest Conferences 1976-1999:

Title, Subject, Author, and Species Indexes for the Proceedings

James S. Fralish, Editor and Compiler

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THE
CENTRAL HARDWOOD FOREST CONFERENCES
1976-1999

TITLE, SUBJECT, AUTHOR, AND SPECIES INDEXES FOR THE PROCEEDINGS

Compiled and Edited by

James S. Fralish

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THE CENTRAL HARDWOOD FOREST CONFERENCES 1976-1999

"I started out reading only a few papers [of Conference VI proceedings], *but they turned out to be so good I decided to evaluate each paper as to whether or not it contained new information for me. I judged that 80 percent of the papers contained new and useful information. That is excellent and demonstrates good work on the part of the scientists and Conference organizers."*

"I believe these conferences are worthwhile and serve a number of good scientific purposes from peer review to exhilaration and enjoyment. They are essential for the process of scientific scrutiny to improve future research and development."

F. Bryan Clark
Excerpt from Conference VII Proceedings

I believe the above statement by Bry Clark on the importance of Central Hardwood Forest Conference VI applies equally to all other meetings in this series. The Central Hardwood Forest Conferences are indeed worthwhile and have largely achieved some of the important goals, albeit not all the goals, outlined by conference originators, Drs. George Weaver, Richard Schlesinger, and me. These goals are no less important today.

The first goal was simply to draw attention to the Central Hardwood Forest as that distinct region located between the Southern Pine-Hardwood and the Northern Hardwood-Pine Regions. This goal has been met. The Central Hardwood Forest is now considered an entity although some may debate the general location of its boundary (Refer to Hicks 1998 (Central Hardwood Forest Conference XI) vs. Roberts and Rathfon 1994 (Central Hardwood Forest Conference VII) vs. Fralish 1994 (Central Hardwood Forest Conference VII)).

Second, the biennial meetings have brought together scientists who actively conduct research on ecology, silviculture, management, and a variety of other topics within the Region. We anticipated that over time the proceedings would achieve a second goal: to concentrate information on the forest. This goal has been accomplished, showing the strength of the Central Hardwood Forest Conferences, which derives in part, from the quality of the scientists and research, and in part, from the concentration of research within a limited geographic area. The conferences succeed because the information published in their proceedings has been concentrated within a region rather than distributed across various North American forest regions.

The third goal, to facilitate a coordinated research program, was too lofty to reach so far, but the meetings and proceedings have provided a framework of ongoing research—a framework visible in the articles within this index.

Overall, the purpose of the Central Hardwood Forest Conferences has been defined and more eloquently rephrased: "To provide a forum for the exchange of information concerning the biology and management of central hardwoods by forest scientists from throughout the Central Hardwood Region of eastern United States" (Gottschalk and Fosbroke 1995). This statement has been repeated in various forms in nearly all proceedings prefaces.

Since the first Central Hardwood Forest Conference in 1976, the biennial proceedings generally have progressively included more articles, research summaries, and abstracts (Table 1) that cover 32 subject areas. In 1989, the proceedings began to be published as a USDA Forest Service General Technical Report, adding credibility to the reported research. Even a casual review of the following indexes indicates that there is considerable solid research information published in the proceedings.

Much of the strength of the Central Hardwood Forest Conference proceedings lies in the review and publication policy that has been in effect since Conference I. Each manuscript appearing in each proceedings is reviewed by two or three scientists with expertise in the appropriate subject area. The editors critically examine each manuscript, and considering peer review comments, accept or reject it. Each accepted manuscript is then returned to the senior author for revision.

Finally, from a personal standpoint, I have received much satisfaction from having helped initiate a conference that has been a lasting influence on and service to the profession of forestry. I hope this influence and service will continue. Much is owed to the 712 professionals whose names appear on the 640 manuscripts and who have carried the conference through 23 years and 12 meetings.

Table 1. Summary of information for 12 Central Hardwood Forest Conference Proceedings. The number of abstracts also includes research summaries. An abstract is defined as a report of one to several paragraphs but not exceeding one page in length. A research summary is one to two pages in length with headings or supporting information such as tables, figures, or citations.

Conference Number	Number of Pages	Number of Articles	Number of Abstracts
I	484	31	0
II	549	37	3
III	465	40	1
IV	390	33	0
V	299	46	0
VI	526	58	9
VII	313	49	6
VIII	605	46	21
IX	515	45	8
X	577	52	29
XI	401	32	29
XII	295	35	30
Total No.	5,419	504	136
Average No./Proc.	452	42	11

ACKNOWLEDGMENTS

Appreciation is expressed to Greg Gipson and Gena Howe for assisting with the development of several indexes and with proofreading.

PREFACES AND TABLES OF CONTENTS
CENTRAL HARDWOOD FOREST CONFERENCE PROCEEDINGS
1976-1999

CONFERENCE I--1976

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NORTH CENTRAL FOREST EXPERIMENT STATION, ST. PAUL, MN

Preface of the First Proceedings

With the proliferation of conferences and symposia during the past few years, the question of "why another one?" is likely to be raised. The rationale behind developing the Central Hardwood Conference and holding periodic meetings is quite clear. There is a necessity to draw attention to the Central Hardwood Region and conceptualize it as ecosystem that is substantially different from the northern hardwood-white pine-hemlock region and the southern pine region. It is not an ecotone between these two regions, but an entity, the uniqueness of which is due to the dominance of the forest by approximately 25 species of oak and 10 species of hickory.

Second, it was felt that there should be a way to periodically draw together the scientists and resource land managers who share a common interest in the central hardwoods; if not to present individual research papers on a variety of topics, then to concentrate efforts in a problem-solving approach or both. At the same time, there seemed a need for publication of research papers on the forest. The "Proceedings" serves this purpose, and over the years, it is anticipated that there will be a sizable volume of information concentrated within a few books.

A longer term objective may be to facilitate or assist a coordinated regional research program. While this objective is visualized, the necessity is real and the program to some extent already on paper. Regional research plans have already been written by the SAF for inclusion in a national research program according to reports given at the 1976 SAF Convention in New Orleans.

Such a research program will be substantially enhanced by, I believe, a developing "hardwood revolution" that is being fueled by the increasing demand for wood products combined with the presently undertapped resource of the Central Hardwood Forest and the dwindling supply of softwood timber. For instance, recent Forest Service statistics show that the loss of loblolly pine stands to hardwood types over a ten to eleven year period is 58 percent in North Carolina, 58 percent in Georgia, and 66 percent on the Coastal Plain of Virginia. The long term implication of these forest type changes, if they continue, is clear.

A final word. It seems appropriate that the areas to be considered by the CHFC are those of ecology, silviculture and management. Certainly it is not possible for the Conference to cover all aspects of the central hardwoods, nor is it necessary as there are already no less than ten active groups and organizations covering topics such as tree improvement, Christmas trees, forest soils, mensuration, economics, and species like walnut and poplar. There are also other meetings of timely interest that are sponsored by forestry departments within the region. At present, the CHFC seems to fill the need for an organization concerned with ecology, silviculture and management of the central hardwoods.

However, the question remains, "Where do we go from here?" in concluding remarks, Orie Loucks raises some thought-provoking questions which may require new and unique approaches to the management of the central hardwoods; these could be considered at a future meeting. No doubt there are scientists and resource land managers who have additional, concerns. Therefore, in order to provide an input of ideas for future meeting topics, a steering committee for the CHFC will be formed in the near future.

The editors and authors sincerely hope that researchers and resource land managers find the contents of this volume interesting and of value.

James S. Fralish
Editor

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SOCIETY OF AMERICAN FORESTERS, &
NORTH CENTRAL FOREST EXPERIMENT STATION, ST. PAUL, MN

Preface of the Second Proceedings

The concerns expressed by Dr. James S. Fralish at the first Central Hardwood Forest Conference (CHFC) are still in vogue. There is still a need "--to draw attention to the Central Hardwood Region and conceptualize it as an ecosystem--", "--to periodically draw together the scientists and resource land managers who share a common interest in the central hardwoods--", and "--to facilitate or assist a coordinated regional research program--".

The central hardwoods have long been viewed as a source of fine hardwood and the "hardwood revolution". Dr. Fralish mentioned "--that was fueled by the increasing demand for wood products and the undertapped resource--" are in even greater evidence today. There is continued national concern with the availability of usable energy-- wood as a full source has regained acceptance. The increase In the number and different types of hardwood using industries within the region has resulted in not only a more complete utilization of the long time commercially valued species but also the utilization of species once regarded as having little commercial value. Today, as never before, there is a need to understand the interrelationships of the Central Hardwood Forest. This fact is underscored by the recent 1978 national meeting of the Society of American Foresters whose major emphasis was directed toward the multiple use of the Central Hardwood Forest.

Phillip E. Pope, Editor

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CONFERENCE III--1980

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Preface of the Third Proceedings

The objectives of the Third Central Hardwood Forest Conference were to 1) provide a forum for the exchange of ideas pertaining to the biology of the Central Hardwood Forest Type; 2) improve communication by bringing together scientists and resource land managers who share a common interest in the Central Hardwood Region; and 3) provide, through the proceedings, an ever expanding and much needed reference on the Central Hardwoods.

The texts of the papers included in this proceedings provide an overview of old and new knowledge of the Central Hardwood Forest type. In his keynote address to this conference, Stephen G. Boyce remarked that the most effective way to use this knowledge is to "stimulate the systematic culture of forests to enhance the benefits perceived by landowners to be in their self-interest." To do less would leave our responsibility to the landowner and the forestry profession only half-fulfilled. It is our hope that through this conference we have, in some small way, made a contribution towards this end.

Harold E. Garrett
Gene S. Cox
Editors

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UNIVERSITY OF KENTUCKY, LEXINGTON

Preface of the Fourth Proceedings

In its development by the editors of the first proceedings, the Central Hardwood Forest Conference was designed to provide a forum for the increased communication and exchange of ideas between scientists and land managers operating in the Central Hardwood Forest Region. Such a forum, of course, relies upon a solid understanding of the biology of the region. Thus, an additional objective of the conference was to provide a centralized mechanism for the exchange of new findings among scientists working in the Central Hardwood Forest Region. It is always hoped that the formal and informal exchanges provided by a conference will contribute to the design of new research programs leading to a greater understanding. These have been the objectives of the second and third conferences and remain the objectives of the Fourth Central Hardwood Forest Conference.

Increased demands upon resources of the Central Hardwood Forest Region require that appropriate management schemes be based upon a firm understanding of the biological foundations of the forest type. It is to be hoped that these and future proceedings will contribute to the wise and sustained utilization of these resources.

Robert N. Muller
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CONFERENCE V--1985

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SOCIETY OF AMERICAN FORESTERS

Preface of the Fifth Proceedings

These proceedings are from the fifth in a series of biennial conferences begun in 1976 at Southern Illinois University. Other past conferences have been sponsored by the Forestry Departments of Purdue University, The University of Missouri, and the University of Kentucky. The purpose of these conferences remains the same: to provide a forum for the exchange of ideas among scientists and forest managers and to facilitate coordinated research in the Central Hardwood Forest Region. The Central Hardwood Forest is an ecological entity dominated by winter deciduous oak and hickory trees in eastern North America. Rather than draw boundaries, the organizers of the conference have entertained contributions of papers not only from the Ohio River Valley, which forms the heart of this region, but also from neighboring regions in the eastern United States and Canada with similar hardwood forests. A variety of research work with a bearing on understanding and managing Central Hardwood forests has been reported in this and past proceedings.

New technologies for using hardwoods, increased exports of hardwood timber ' and other factors outlined in the keynote paper of this conference indicate that the time is coming when this regional forest resource may increase in economic importance. Thus, a biological basis for managing these forests may become increasingly critical. Additionally, the contributions of this resource in providing clean water, recreational opportunities, wildlife habitat, soil stabilization, and other benefits in an increasingly developed landscape in the eastern United States indicate the importance of our understanding hardwood forests. We hope that this and future conferences in the series continue to broaden our biological understanding of this valuable forest ecosystem.

Jeffrey O. Dawson
Kimberly A. Majerus
Editors

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CONFERENCE VI--1987

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SOUTHERN FOREST EXPERIMENT STATION, &
SOCIETY OF AMERICAN FORESTERS

Foreword of the Sixth Proceedings

As the pressures from urban sprawl, highway development, agriculture, resort development, industrialization and the designation of wilderness and special-use lands increase, the amount of forested land manageable for multiple purposes correspondingly decreases. There is little doubt that this problem will intensify in the Central Hardwood Region, a region which seems destined to become more populated, more urbanized and more industrialized, even within our immediate planning horizons. How should foresters, whose task it is to husband the total forest resource, react to these rapidly changing conditions? Obviously, they must become better informed to find those answers; one way to become better informed is to personally communicate and interact with co-workers.

Such was the setting for the Sixth Central Hardwood Forest Conference. The objectives of the Conference were (1) to draw attention to the Central Hardwood Region, (2) to provide a forum where people with ideas might interact, and (3) to facilitate coordinated regional research. The extent to which we have been successful will only be proven by time. This conference alone will not provide all of the answers that we need and neither will a dozen more. It will however, add to our total knowledge and make us more able to understand the complex and intriguing nature of the forest environments in which we live. We can only hope that our ability to cope with the changes we can expect in the future will not be exceeded by the impetus which such changes have already gained.

As organizers of a Conference that is now history, we respectfully suggest that the next Conference devote a substantial part of the program to forest change due to the human element of the environment and to the needs of people for amenities of hardwood forests other than wood. Perhaps our Conference became more of a forestry conference, rather than a forest conference which should consider much of the total forest resource and its uses. No matter how well we understand the silviculture, physiology, taxonomy, ecology, and other technical aspects of forests, people will ultimately help determine the extent and type of uses for which our forests will be managed. If we fail to include them in our management assessment, we will. most certainly lose our preferred status as forest managers.

Ronald L. Hay
Frank W. Woods
Hal R. DeSelm
Editors

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CONFERENCE VII--1989

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NORTH CENTRAL FOREST EXPERIMENT STATION, ST. PAUL, MN

NCFES General Technical Report NC-132

Preface of the Seventh Proceedings

The three primary objectives of the Central Hardwood Forest Conference are: (1) to provide identity to the Central Hardwood Forest Region as an entity, (2) to provide a communicative forum for scientists with a common interest in the central hardwoods, and (3) to coordinate regional research.

Although most Conferences have had a definite ecological and/or traditional forestry orientation, authors of the Foreword to the Sixth Proceedings (1987) suggested that the Seventh Conference (i.e., the present one) "devote a substantial part of the program to forest change due to the human element of the environment and to the needs of people for amenities of hardwood forests other than wood". These authors also suggested that if we, as forest managers, fail to include the human element in land management assessment we will most likely lose the confidence of the lay public. Partially in response to this type of concern, a panel discussion by policy level personnel in the Central Hardwood Region was included on the first morning of this conference to discuss research management priorities.

The Seventh Central Hardwood Forest Conference was held on the campus of Southern Illinois University at Carbondale, Carbondale, IL, also the site for the first Central Hardwood Forest Conference. Attendance at these conferences has steadily increased, a measure of the quality of the research results, as well as acceptance of the need *for* this type *of forum*. We wish the *hosts of* the Eighth Conference at least equal success.

George Rink
Carl A. Budelski
Editors

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CONFERENCE VIII--1991

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BUREAU OF FORESTRY,
PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES

NEFES General Technical Report NE-148

Foreword of the Eighth Proceedings

This conference is the eighth in a series of biennial meetings that began in 1976 at Southern Illinois University. Other conferences have been hosted by Purdue University, University of Missouri, University of Kentucky, University of Illinois, and University of Tennessee. The purpose of these conferences has remained the same: to provide a forum for the exchange of information concerning the central hardwoods and to engender coordination among forest scientists in the Central Hardwood Region. This purpose is evidently well-served: the last several conferences have each attracted some 45 to 65 program contributions, and the audiences have been correspondingly large.

Previous organizers have refrained from drawing precise boundaries around the "Central Hardwood Region." We prefer to continue that policy on the grounds that to do otherwise might preclude some very worthwhile participation. Thus, while the principal focus has remained on the oak resource for reasons that are obvious, the ecological scope has broadened from oak-hickory (in the early meetings) to Appalachian oak (Knoxville and State College) and mesophytic forests. With a few exceptions, the commercially significant species are similar for all these forest types, and advancements in knowledge are of general interest.

But the Central Hardwood Region is not merely a collection of similar forest types. It also has historical, demographic, political, and economic characteristics that tend to distinguish it from other forest regions of the United States. For example, the population is heavily rural and agricultural, primary wood markets tend to be diffuse and unorganized, wilderness values and endangered species have generally not been overriding issues, and a relatively minor proportion of the forest land is controlled by public agencies or corporate ownerships. These and related conditions play critical roles in the practice of forestry in this region, and in the aggregate they emphasize its distinction from other regions; but no single one is necessarily unique to the central hardwoods. For these reasons, the characteristics of nonindustrial private forest land owners in Massachusetts might be just as relevant to the Central Hardwood Region as regeneration methods for white oak in Indiana.

Since these proceedings are being published in advance, we have no way of judging the ultimate success of the upcoming Eighth Conference. Of course, our earnest hope is that this meeting shall sustain the excellent reputation of the series. We believe this hope is encouraged by the quality of the papers in these proceedings.

Larry H. McCormick
Kurt W. Gottschalk
Editors

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CONFERENCE IX--1993

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NORTH CENTRAL FOREST EXPERIMENT STATION, ST. PAUL, MN

NCFES Technical Report NC-161

Foreword of the Ninth Proceedings

This proceedings resulted from the ninth in a series of biennial conferences held at various Universities throughout the Central Hardwood Forest Region. The conference was successful in providing a forum for discussion of the biology and management of hardwood forests by scientists from throughout the eastern United States. Papers contained within this proceedings provide a continuing documentation of the broad array of research programs attempting to understand this diverse forest resource. As with previous proceedings topics range from basic biology and ecological processes to economic value and management.

The social and biological characteristics of the Central Hardwood Region make it unique in comparison with other forest regions of the United States. One-fourth of the United State's human population reside in this region. Approximately 90% of the land is in private ownership and public lands tend to be small and fragmented with private inholdings. The papers presented in this proceedings are important to the long-term management of this unique region.

Andrew R. Gillespie
George R. Parker
Phillip E. Pope
Editors

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CONFERENCE X--1995

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NORTHEASTERN FOREST EXPERIMENT STATION, RADNOR, PA

NEFES General Technical Report NE-197

Foreword of the Tenth Proceedings

This conference is the tenth in a series of biennial meetings that began in 1976 at Southern Illinois University. Other conferences have been hosted by Purdue University, University of Missouri, University of Kentucky, University of Illinois, University of Tennessee, Southern Illinois University with the North Central Forest Experiment Station (NCFES), Pennsylvania State University with the Northeastern Forest Experiment Station, and Purdue University with NCFES. The purpose of these conferences has remained the same: to provide a forum for the exchange of information concerning the biology and management of central hardwoods by forest scientists from throughout the Central Hardwood Region of the eastern United States. As with previous Proceedings, a wide range of topics that represent the broad array of research programs in this area is represented.

The social and biological characteristics of the Central Hardwood Forest Region make it unique in comparison with other forest regions of the United States. For example, one-fourth of the United States human population resides in this region. Approximately 90% of the land is in private ownership and public lands tend to be small and fragmented with private inholdings. These and related conditions play critical roles in the practice of forestry in this region. The information presented in this Proceedings is important to the long-term management of the forest resources of this unique region.

Kurt W. Gottschalk
Sandra L. C. Fosbroke
Editors

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CONFERENCE XI--1997

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NCFES General Technical Report NC-188

Foreword of the Eleventh Proceedings

This conference is the eleventh in a series of biennial meetings that began in 1976 at Southern Illinois University. Other conferences have been hosted by Purdue University, University of Kentucky, University of Illinois, University of Tennessee, Southern Illinois University with the North Central Forest Experiment Station (NCFES), Pennsylvania State University with the Northeastern Forest Experiment Station (NEFES), Purdue University with NCFES and West Virginia University with the NEFES. The purpose of these conferences has been the same: to provide a forum for the exchange of information concerning the biology and management of Central Hardwood forests by forest scientists throughout the region. As with previous proceedings, a wide range of topics that represent the broad array of research programs in this region are presented. The information in this Proceedings is important to the long-term management of forest resources in this unique region.

Stephen G. Pallardy
Robert A. Cecich
H. Gene Garrett
Paul S. Johnson
Editors

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CONFERENCE XII--1999

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SRS General Technical Report SRS-188

Foreword of the Twelfth Proceedings

The Central Hardwood Forest stretches from the upper Southeast to the Great Lakes and from Arkansas to Massachusetts. It is an oak-dominated deciduous forest occurring in hilly to mountainous areas of this vast region. As such, it is the most extensive temperate deciduous forest in the world. The tree species present are well adapted to the seasonal climate changes and the moderate rainfall found in the region. The Central Hardwood Forest developed since the last ice age as forests reinvaded the region. Land-use practices impacting the region include those imposed by Native Americans as well as significant impacts from European settlers. These impacts include burning, grazing, land clearing, logging, fire control, wildlife management, and pest introductions. These practices and impacts have influenced, to a large degree, the composition and the area covered by these forests.

One-fourth of the population of the United States lives in this region and approximately 90 percent of the Central Hardwood Forest is owned by private interests comprised primarily of nonindustrial forest owners. The Central Hardwood Forest is biologically and spatially complex. The body of knowledge developed by scientists and practitioners on the biology and management of this forest is critical to the continued health and sustainability of this forest, The Conference provides a significant opportunity for scientists and practitioners to exchange information that will ultimately play an important part in the development of the Central Hardwood Forest.

This Conference is the 12th in a series of biennial meetings that have been hosted by numerous universities and USDA Forest Service Experiment Stations in the Central Hardwood Forest Region.

The purpose of this Conference has remained the same since its inception "To provide a forum for the exchange of information concerning the biology and management of central hardwoods by forest scientists from throughout the Central Hardwood Region of the Eastern United States." As with previous conferences in this series, a wide range of subjects have been presented representing the range of research efforts underway in the region.

Since its beginning, the Central Hardwood Forest Conference has been an outlet for results of research focused on the forest itself or species that occur in the Central Hardwood Region. There were 32 oral presentations, 11 abstracts, and 22 poster presentations accepted for the 12th Conference. Poster and oral presentation abstracts were accepted for publication along with full-length manuscripts. Manuscripts have undergone a peer review process by two to three anonymous reviewers. Reviewed manuscripts were returned to authors and revised electronic manuscripts were submitted for publication to the USDA Forest Service, Southern Research Station. In total, 7 percent of the manuscripts were rejected, 36 percent required major revision, 45 percent required minor revision, and 12 percent were accepted without revision. Papers were edited to a uniform format and type style; however, authors are responsible for the accuracy and content of their papers.

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PLANT AND ANIMAL SPECIES INDEX
TO
CENTRAL HARDWOOD FOREST CONFERENCE PROCEEDINGS I-XII

Roman numbers indicate the conference and proceedings volume number corresponding to the following years: I--1976; II--1978; III--1980; IV--1982; V--1985; VI--1987; VII--1989; VIII--1991; IX--1993; X--1995; XI--1997; XII--1999. Arabic numbers indicate the page number.

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